

What is claimed is:

1. A polishing sheet having an elastic plastic foam sheet, wherein the elastic plastic foam sheet has a polishing layer which is disposed inside a surface layer and which is allowed to wear away by polishing and whose thickness is larger than a thickness of the surface layer, and wherein the polishing layer has an approximately uniform foam structure in a direction of the thickness of the elastic plastic foam sheet by being formed foams whose space volume is larger than that of foams formed at the surface layer and which are communicated so as to form a network by continuous holes whose diameter is smaller than that of the space volume of the foams formed at the polishing layer.

2. A polishing sheet according to claim 1, wherein a thickness of the polishing layer is not less than 50 μ m.

3. A polishing sheet according to claim 1, wherein the elastic plastic foam sheet is made of polyurethane.

4. A polishing sheet according to claim 1, wherein the elastic plastic foam sheet is integrally formed by the surface layer, the polishing layer, and an elastic layer which gives elasticity to the polishing layer.

5. A polishing sheet according to claim 4, wherein foams, whose space volume is larger than that of the foams formed at the polishing layer and which are long in the direction of the thickness of the elastic plastic foam sheet, are formed at the elastic layer.

6. A polishing sheet according to claim 1, wherein the polishing sheet further has a supporting layer which is made of at least one selected from a flexible film, a nonwoven fabric and a woven fabric and which is disposed at one side of the elastic plastic foam sheet to support the elastic plastic foam sheet.

7. A polishing sheet according to claim 6, wherein the polishing sheet further has an elastic layer which gives elasticity to the polishing layer and which is disposed between the elastic plastic foam sheet and the supporting layer.

8. A polishing sheet according to claim 7, wherein the polishing sheet further has a flexible film between the elastic plastic foam sheet and the elastic layer.

9. A polishing sheet according to claim 1, wherein a groove for accommodating and discharging shavings occurred from a material to be polished is formed at the surface layer and the polishing layer.

10. A polishing sheet according to claim 1, wherein the surface layer is removed from the elastic plastic foam sheet.

11. A polishing sheet according to claim 10, wherein a thickness of the polishing layer is not less than 50 μ m.

12. A polishing sheet according to claim 10, wherein the elastic plastic foam sheet is integrally formed by the polishing layer and an elastic layer which gives elasticity to the polishing layer.

13. A polishing sheet according to claim 10, wherein the polishing sheet further has a supporting layer which is made of at least one selected from a flexible film, a nonwoven fabric and a woven fabric and which is disposed at one side of the elastic plastic foam sheet to support the elastic plastic foam sheet.

14. A polishing sheet according to claim 10, wherein a groove for accommodating and discharging shavings occurred from a material to be polished is formed at the polishing layer.

15. A manufacturing method of an elastic plastic foam sheet

for a polishing sheet, comprising the steps of;

coating approximately uniformly a polyurethane resin emulsion, which includes a polyurethane resin, a first organic solvent that the polyurethane resin can be dissolved, and a second organic solvent whose solubility to water is smaller than that of the first organic solvent and which controls coagulation of the polyurethane resin, to a base material; and

soaking the base material coated by the polyurethane resin emulsion into a coagulation liquid whose main component is water,

and wherein the elastic plastic foam sheet has a polishing layer which is disposed inside a surface layer and which is allowed to wear away by polishing and whose thickness is larger than a thickness of the surface layer, and the polishing layer has an approximately uniform foam structure in a direction of the thickness of the elastic plastic foam sheet by being formed foams whose space volume is larger than that of foams formed at the surface layer and which are communicated so as to form a network by continuous holes whose diameter is smaller than that of the space volume of the foams formed at the polishing layer.

16. A manufacturing method according to claim 15, wherein the second organic solvent is ethyl acetate, and the polyurethane resin emulsion is prepared by adding the second organic solvent of a range of from 20 parts to 45 parts to a polyurethane resin solution, that the polyurethane resin is dissolved into the first organic solvent, of 100 parts.

17. A manufacturing method according to claim 15, wherein the method further comprising a step of removing the surface layer from the elastic plastic foam sheet.

18. A manufacturing method of an elastic plastic foam sheet for a polishing sheet, comprising the steps of;

coating approximately uniformly a polyurethane resin emulsion, which includes a polyurethane resin and a third organic solvent that

the polyurethane resin can be dissolved, to a base material; and soaking the base material coated by the polyurethane resin emulsion into a coagulation liquid including a fourth organic solvent and water,

and wherein the elastic plastic foam sheet has a polishing layer which is disposed inside a surface layer and which is allowed to wear away by polishing and whose thickness is larger than a thickness of the surface layer, and the polishing layer has an approximately uniform foam structure in a direction of the thickness of the elastic plastic foam sheet by being formed foams whose space volume is larger than that of foams formed at the surface layer and which are communicated so as to form a network by continuous holes whose diameter is smaller than that of the space volume of the foams formed at the polishing layer.

19. A manufacturing method according to claim 18, wherein a density of the fourth organic solvent in the coagulation liquid is ranged of from 20 weight percent to 50 weight percent.

20. A manufacturing method according to claim 18, wherein the method further comprising a step of removing the surface layer from the elastic plastic foam sheet.